

2.0 New Request for Further Information - Review of Aquatic Ecology and Water Quality Matters

WCRC Request 2.11

2.11 Please give further consideration to the potential effects of the proposed dam and lake on the whitebait fishery.

Meridian Response 2.11

Potential for landlocked koaro populations. It is not possible to predict with certainty if koaro will form landlocked populations in the lake created by MHP. While any koaro that are retained in the lake will have ready access to suitable adult habitat in the tributaries, the short residence time of water in the lake is expected to result in most koaro larvae being washed downstream to the sea (see response 2.13). If landlocked populations of koaro do establish, they would be “additional” to diadromous (migratory) populations. The main aim should be to maintain stocks of koaro upstream of the dam – and to do so will require recruitment of juvenile koaro (whether they are of migratory or landlocked origin) into small, forested tributaries where adult koaro live and breed.

Effectiveness of “trap and transfer” system. Koaro are well known for their climbing ability (they are sometimes referred to as climbing whitebait), and are even capable of ascending structures designed to prevent their passage (eg juvenile koaro climb the damp vertical concrete walls of a velocity barrier in the Wairehu Canal, which carries water diverted from the Whakapapa River into Lake Rotoaira in the upper Wangai catchment – a barrier that was constructed for the purpose of preventing the upstream passage of fish). This climbing ability, and their aggressive migratory behaviour, should facilitate their capture and transfer. Juvenile koaro passage could be assisted by “pool and weir” passes, fish locks/elevators, “climbing” or “insinuation” passes; these may all be effective for koaro, but probably less effective for other species of native fish, especially eels. A “trap and transfer” pass should be effective for eels, koaro and other migratory native species, and would have the advantage of being easily monitored, relatively simple, and adaptable.

WCRC Request 2.12

2.12 If koaro are successfully transferred upstream past the dam will the 14 km lake (and/or predators within the lake) prevent access to the small forested streams which are the preferred habitat for adult koaro?

Meridian Response 2.12

Fish caught at the bottom of the dam using a trap-and-transfer system, could be transferred directly into the lake above the dam, or transported elsewhere (eg to the head of the lake, or to selected tributaries) to minimise loss from predators in the lake if that became an apparent issue for Koaro.

WCRC Request 2.13

2.13 What is the likely affect of the lake on downstream passage of the newly hatched larvae, i.e., is there a risk that most larvae will be retained within the lake and not contribute to regional whitebait stock?

Reason for Request: - Bonnett et al (2007) note that the highly regarded whitebait fishery is composed predominantly of koaro. They note also that "koaro spawning in the Mokihinui may contribute to regional whitebait stocks", and that the proposed dam and the lake may "have some effect on the Mokihinui River's contribution to regional whitebait stocks". There is some considerable uncertainty about whether a landlocked population of koaro will form in the lake. There is also some uncertainty about the effectiveness of the "trap and transfer" pass as a means of providing upstream passage of juvenile koaro past the dam. Overall there are a range of factors which could potentially lead to a decline in regional whitebait stocks and in the Mokihinui River whitebait fishery, which need clarification.

Meridian Response 2.13

Koaro spawn in small forested tributary streams during high flows in the autumn, and eggs are deposited amongst inundated riparian substrates. After flows recede, the eggs are exposed (out of the water) for days or weeks, but remain moist as they are shaded by streamside vegetation and substrates. Hatching only occurs when the eggs are re-inundated by a subsequent flood, and the newly hatched larvae are carried downstream to sea by the flood flows. The larvae are less than 10mm in length, and they have limited swimming ability, so the chances of their being retained in the lake probably depend completely on the speed of water through the lake, or water residence time – ie the shorter the water residence time, the greater their chances of being washed out to sea and contributing to regional stocks. Some basic assumptions were used to estimate the length of time water, and therefore koaro larvae, may remain in the proposed lake:

- a. Lake volume about 98,000,000 cubic metres
- b. Mean flow of Mokihinui River about 90 cumecs
- c. Mean annual flood about 1840 cumecs
- d. The proposed lake will be about 14 km in length

At mean flow, water residence time is about 300 hours (12.5 days), or in other words, water is moving down through the lake at about 1.2 cm/sec. During a “mean annual” flood of 1840 cumecs, water residence time in the lake would be about 15 hours, (moving at about 26 cm/sec). Residence times and water speed at flows intermediate between mean and mean annual are summarised in the following table.

As the hatching of larvae will coincide with floods, it follows that they will proceed downstream to the sea relatively quickly. It should be noted that these estimates are probably quite conservative, as they are based on total replacement of the lake volume, whereas during floods, much of the inflowing water may move down the lake on top of existing water without mixing – meaning that residence time of koaro larvae would be much shorter, and their speed through the lake much higher. Overall it seems unlikely that many larvae will be retained in the lake.

Table. Mokihinui River - water residence time and velocity through the lake at various flows

	flow (m ³ /sec)	Residence time		Water velocity
		<i>hours</i>	<i>days</i>	<i>cm/sec</i>
mean flow	90	302.5	12.6	1.2
	120	226.9	9.5	1.7
	200	136.1	5.7	2.9
	300	90.7	3.8	4.3
	400	68.1	2.8	5.7
	500	54.4	2.3	7.1
	1000	27.2	1.1	14.3
mean annual flood	1840	14.8	0.6	26.3

3.0 New Request for Further Information – Archaeological, Cultural and Historic Heritage Matters

WCRC Request 3.4

3.4 Please provide an assessment of all historic and archaeological sites likely to be affected by the MHP, carried out within the framework of the Buller District Plan and the West Coast Regional Policy Statement.

Reason for Request: - The historical sites in the MHP footprint have not been assessed according to the criteria stipulated in several statutory planning documents prepared under the RMA (the Buller District Plan, the West Coast Regional Policy Statement). Given the greater focus on local and regional values in these than in the Historic Places Act and draft DoC CMS, it is possible that the sites, especially the pack track, will prove to have a higher assessed value than currently. The application is currently passing through the RMA consent process and it is therefore appropriate that RMA definitions and assessment criteria are used in any evaluation.

Meridian Response 3.4

Heritage sites located within the footprint of the MHP were assessed in regard to criteria outlined in the Historic Places Act 1993 (Section 23), with consideration to the Resource Management Act 1991 (Section 6) and in accordance to accepted assessment standards outlined in *Guidelines for Writing Archaeological Assessments* produced by the Historic Places Trust.

In relation to criteria outlined in local policy documents (West Coast Regional Policy Statement Section 6.1), the following comments are made:

a) *The extent to which the place reflects important or representative aspects of New Zealand history*

The Mokihinui River valley was the site of gold exploration and mining, primarily in the 1870s and 1880s. Associated with this was the development of a small settlement up the valley, Seatonville, and associated hut sites, machinery work sites and pack tracks. This pattern of exploration, settlement and associated extractive industry and abandonment is evident in other areas of the West Coast (for example Lyell) and elsewhere in New Zealand (Otago, Coromandel).

On their own, it is my professional opinion that the Mokihinui gold mining sites, as a group, can be considered to be of regional significance, forming part of the original European settlement history of this part of the West Coast. It is important however to link this area of gold mining exploration with that elsewhere on the West Coast and around New Zealand.

The Mokihinui, and Rough and Tumble Creek areas are also regionally significant in terms of the role that they played in both pre-European and European periods as transportation

routes. Tracks existed alongside both waterways to provide access north to Karamea and inland to the Mokihinui Forks and Lyell.

b) the level of association of the place with events, persons, or ideas of importance in the history of the district / region

The gold mining activities and evidence that remains is of regional significance. As is noted above, many of the events, features and activities that occurred are reflected in other similar sites on the West Coast and elsewhere in New Zealand. It is noted that there are memorials on part of the Mokihinui pack track to individuals associated with the area (eg the Russell Crosses). These are of local significance.

c) the importance of the place to Poutini Ngai Tahu

Statements on the importance of a place to tangata whenua can only be made by tangata whenua. Meridian Energy have carried out consultation with Ngati Wae Wae on this matter.

d) the level of community association with or public esteem for, the place

There is strong local community association with the sites and pack track along the Mokihinui River, and the values attached to these features should be considered as high. Similarly there are strong association with sites within the Charming Creek area and along the route of the proposed transmission line. The community association with the historic sites in the area can be attributed not only to the general appreciation for the heritage sites, but also to the fact that many of the older residents have some personal association with the historic mining operations in the area, as descendants of many of those who worked at the sites. Having stated this however, due to the poor general condition of the Mokihinui Gorge pack track for much of its length, visitation numbers are low, particularly past the site of the Iron Bridge over the Mokihinui to Rough and Tumble. Due to its condition the track is generally only used by experienced back country trampers and hunters (R Greenaway pers. comm.).

e) the potential of the place for public education

As is noted in the archaeological assessment report for the project, at present there is little potential for interpretation of many of the sites within the MHP area. This is largely a result of poor access, dense vegetation growth obscuring features, and the poor condition of some of the features. With the development of the MHP, while some features will be affected (generally within the inundation area) the potential to present and interpret features and the history of the Mokihinui district will be greatly increased.

d) the level of technical accomplishment or value, or design of the place, including the rarity of technical accomplishment or design

The nature and type of sites located within the project area are similar to other sites associated with mining (gold and coal), timber extraction and isolated settlements.

Movement of miners around gold fields, nationally and internationally, was common and it was often through this that new information and technologies were shared. While locally significant, the heritage sites within the MHP area (river valley and transmission line) do not represent high or significant technological accomplishments. It is of note that some of the place names in this area are linked with significance mining and industrial sites in the United Kingdom (eg Coalbrookdale), identifying a social and cultural link.

It is noted in the archaeological report prepared as part of the consent application that there are potentially moderate to high archaeological values associated with the settlement site and examples of social adaptation to settlement in isolation. The potential recovery of this information through archaeological investigation (pending Historic Places Trust authorities), will provide an opportunity to understand and interpret this information for visitors to the area.

g) The symbolic or commemorative value of the place

The sites within the MHP are could be considered to have moderate commemorative value, in terms of sites representing the achievements of explorers, surveyors, miners and settlers. There is no one symbolic or commemorative value that can be associated with this place.

h) Whether it is an historic place known to date from early periods of the district's settlement

All of the identified (and potentially unidentified) heritage sites within this area are significant in that they are associated with some of the earliest European settlement of this part of the West Coast. The routes that later became the pack tracks are also significant in that they were originally used by pre-European Maori as access along the coast to Karamea and inland.

i) The rarity of the type of historic place; and

As is stated, the historic sites within this area are not considered to be rare as similar sites can be found elsewhere on the West Coast. Having stated this, all archaeological sites potentially contain significant information on the use of any place.

j) the extent to which the place forms a key part of a wider historical and cultural complex or historic and cultural landscape.

On their own, the heritage sites within the MHP area are considered to be of regional significance. The sites do however form part of the wider picture of gold mining and exploration not only of the West Coast in the 1860s – 1880s, but also nationally and internationally. Appropriate recording and investigation of those sites that are to be physically impacted by the project will allow a better understanding of the sites. Retention of some of the features (settlement, mines, parts of pack track) and provision of a better access track will allow better access to the sites.

WCRC Request 3.5

- 3.5 Please provide a map that shows the various sections of track coded according to present condition (e.g. good, average, poor, destroyed).

Reason for Request; - It is not clear how much of the pack track currently remains more or less intact and how much has been damaged or destroyed by slips etc.

Meridian Response 3.5

The Mokihinui Gorge Track has not been formally surveyed as to its condition. It has been walked by Rob Greenaway, Peter Rough and Andrew Craig with a GPS. However, due to the depth of the gorge, the GPS tracking was largely unusable.

Photos are provided in Attachment A which show various sections of the track and its typical condition. Approximately 70 to 80% of the track is in good to average condition and would qualify as a 'tramping track' or even an 'easy tramping track' in many places, according to SNZ HB 8639:2004. The DOC classification of the track as a 'route' is based on the remaining 20 to 30% which features major and minor slips and un-bridged stream crossings. The upper 1.5 to 2 kms of the track is a true 'route', having no real formation and marked only by orange triangles (it is very easy to lose the track here). These slips and unformed sections are essentially 'weak links in the chain' and represent considerable impediments to those seeking a normal or easy tramp – hence the general classification as a 'route'.

WCRC Request 3.6

- 3.6 Please undertake a survey of any proposed transmission line construction road lines and an assessment of effects on any archaeological deposits.

Reason for Request: - The transmission line runs close to the northern extent of the Charming Creek walkway and passes an area where historical sites could be expected.

Meridian Response 3.6

Meridian Energy have applied for a 20 m wide corridor for the transmission corridor. Until such time as detailed planning and micro-siting of transmission poles is carried out, the exact location of these and the required access tracks within this corridor have not been determined. It is proposed that archaeological inspections of these sites will be carried out at that time. The identification of a 20m wide corridor will allow a degree of flexibility in the location of poles and any access tracks that may be required and it will be possible to amend the location of poles and tracks to avoid historic features as and when these locations have been identified.

I note that there was a final query from Council regarding the potential to reinstate the track up the Rough and Tumble Creek to Karamea. A small part of this historic track will be affected by the inundation resulting from the dam and it has been recommended that this part of the track is surveyed and recorded in detail prior to any impact from the project. Reinstatement of part of the track would be positive mitigation for the loss of this and part of the Mokihinui track. In examining options for reinstating the track however it will

also be necessary to examine potential access to the track as it would be located on the northern side of the resulting hydro lake, with no road access.

WCRC Request 3.7

- 3.7 Please provide an assessment of visual effects on the heritage experience of visitors to the Charming Creek walkway. This assessment should include consideration of the possibility of moving the transmission line so it is not visible from the walkway.

Reason for Request: - The transmission line may be visible from the Charming Creek walkway.

Meridian Response 3.7

The assessment requested is included in the Assessment of Landscape and Visual Effects prepared by Peter Rough Landscape Architects Limited which is Appendix 14 of the application for resource consents. In particular we refer you to section 4.5 of that report.

WCRC Request 3.8

- 3.8 Please comment on the feasibility of reinstating the Mokihinui-Karamea road/pack track and on how you might consider linking the reinstated track (or section of track) into existing track networks.

Reason for Request: - One of the submitters has recommended that the old pack track up the Rough and Tumble Creek to Karamea be reinstated. It is unlikely to be practical to reinstate the track all the way to Karamea, but a shorter section might be more feasible. Such a reinstatement could provide a degree of offset mitigation for the loss of the Mokihinui pack track.

Meridian Response 3.8

The partial or total reinstatement of the Mokihinui-Karamea road/pack track is not considered necessary to mitigate any effect of the MHP and does not form part of the current application.

WCRC Request 3.9

- 3.9 Please advise how you have met your requirements to consult under the principles of the Treaty of Waitangi, and the provisions of Part 2 of the Resource Management Act in terms of the other iwi who have declared rohe over the application area, especially since the issue of the CIA.

Reason for request: - Prior to lodging the application, Buller District Council advised you that the matter between the top of the south iwi and their claim on parts of the Buller had been considered by the Privy Council and that the court had confirmed Ngai Tahu as being the sole tangata whenua of the Buller district. Since then, the Waitangi Tribunal have ruled that the top of the south iwi do have a right for claim.

At the time of notifying the application, the Councils served notice on Ngai Tahu, Ngati Waewae and Ngati Apa Ki Te Waiponamu Trust, the iwi who had identified the Buller District as a local authority their Iwi rohe had an interest in. Only Ngati Waewae submitted on the application, requesting that a CIA be undertaken.

Meridian Response 3.9

There is no requirement that an applicant for a resource consent consult with any person (Clause 1AA of the First Schedule to the Act). However, Meridian's response to the issue raised is:

- a. Meridian became aware that Top of the South iwi had a claim in relation to land including in the area of the Mokihinui River as a result of a submission made to the Department of Conservation on the proposed Kawatiri Heritage Park by Ngati Apa. This was before the consent applications were lodged and notified.
- b. Meridian raised this issue with the Buller District Council which has a duty under section 35A of the Act to maintain records about iwi and hapu in the District. As you note in your request, the Council advised that only Ngai Tahu was recognised as tangata whenua in the District.
- c. Meridian has relied upon that advice.
- d. As you note in your request, the Councils served notice of the consent applications on Ngati Apa as well as Ngai Tahu and Ngati Waewae. Presumably, the decision by Councils as to which iwi authorities to serve was based on a consideration of Councils duties under Regulation 10(2) of the Resource Management (Forms) Regulations 2003, and Meridian has no issue with the decision made.
- e. Meridian also notes that the applications were publicly notified and all iwi and hapu had an opportunity to make a submission if they had concerns about aspects of the proposal. Only Ngati Waewae chose to do so.

WCRC Request 3.10

3.10 Please clarify if the CIA forms part of your application and also provide comment on apparent inconsistencies between it and the submission received from Ngati Waewae.

Reason for request: - Question 1.4 of the original RFI has been addressed by matters within the draft CIA, We wish to clarify whether if the CIA now forms part of your

application? The purpose of this clarification is that there are some unresolved differences between the CIA and the submission made by Ngati Waewae.

Meridian Response 3.10

The CIA does not constitute a formal part of Meridian's application. It is an independent report commissioned by Meridian which provides information which has informed Meridian as to the potential cultural effects of the MHP. Meridian's view is that the CIA will also be of assistance to the Commissioners in this regard. Any apparent inconsistencies between the CIA and the submission made by Ngati Waewae will be best explored by the Commissioners when they hear from submitters.

4.0 New Request for further information - Review of Coastal Processes and Sediment Transport matters

WCRC Requests 4.8, 4.9 & 4.10

- 4.8 Please detail the current process and the stage Meridian are at in regard to community consultation on the issues of coastal and river erosion mitigation.

Reason for request: - In order for the consent authority to consider appropriate conditions to mitigate adverse effects of the proposal, and in order to consider the conditions proposed by Meridian

- 4.9 Please provide the Terms of Reference of the Consultative Group or details on the community consultancy including; who is involved, what affected parties they represent, and briefly what are the group's activities.

Reason for request: - It is understood that further research, along with monitoring of actual effects is proposed by Meridian as a means of determining existing and future rates of coastal and river erosion. It is also understood that the methodologies for addressing erosion have been discussed with affected parties; however it is not clear what the terms of reference are and what effected parties are represented.

- 4.10 What (if any) mitigation measures are proposed, and what work has been undertaken and/or needs to be undertaken to action mitigation measures?

Reason for request: - In order for the consent authority to consider appropriate conditions to mitigate adverse effects of the proposal, and in order to consider the conditions proposed by Meridian

Meridian Response 4.8, 4.9 & 4.10

By means of providing background to the consultation group and its evolution, Meridian also offer the following summary (principally to address request 4.9):

- Meridian held a meeting for the Mokihinui ratepayers on 19 April 2008 at the Mokihinui Domain. No formal minutes were taken of the meeting, however notes taken at the time of the meeting were taken and have been circulated to the Mokihinui ratepayers representatives for comment (no comments received).
- Following the initial public meeting, the ratepayers association formed a working group (MRWG) to consult with Meridian on behalf of the wider ratepayers association. The MRWG is not mandated to make binding decisions on behalf of the community, rather participate in ongoing meetings and present the outcome of those meetings back to the Mokihinui ratepayers. Further details of this process will need to be provided directly by MRWG members.

- The first meeting with the MRWG on 15th May 2008 set about establishing a meeting format followed by a presentation of Meridian of the mitigation options available. It was made clear to the MRWG that Meridian did not necessarily agree with all options presented, rather included them as a basis for further discussion. A copy of the minutes taken from the meeting have been circulated to the MRWG for comment.
- The second MRWG meeting held on 19th June 2008 focused on considering two broad options for erosion control, an engineered rock wall at or about the location of the existing gravel wall, or the option of managed retreat. The majority of MRWG working party expressed a preference for the option of a rock wall. The minutes from the meeting are currently being compiled and will shortly be sent to the MRWG for comment.

To help the Council's understanding of consultation regarding coastal erosion matters relevant to MHP, we suggest a meeting at your earliest convenience. This would ideally involve the Council's planner, Council's coastal consultant, Meridian consents manager(s) and representation from the Mokihinui Ratepayers Association Working Group (MRWG). The reason for this suggestion is that considerable consultation has been undertaken with the MRWG over many months in what could be described as a highly iterative process. Much communication has been in group meetings and/or discussions such that receiving (and replying to) requests for further information is not particularly efficient or effective in terms of methods to assist the Council. We would be very happy to facilitate such a meeting occurring and coordinate timing for participants other than Council representatives. Minutes of the meetings could be supplied to the Council if required, subject to agreement of the WRWG. We look forward to your response on this matter.

Notwithstanding the above comment, Meridian offers the following response to WCRC requests (ref 4.8, 4.9, 4.10). In summary, the MRWG and Meridian have openly discussed several options to address coastal erosion. Underlying all options is a clearly understood i) acknowledgement by MRWG that there is an existing coastal erosion problem that will continue irrespective of MHP and ii) acknowledgement by Meridian that MHP will exacerbate the problem to some degree (extent or timing) and that Meridian is willing to be a partner in endeavours to find solutions.

As of June 2008, the preferred solution, as expressed by the MRWG, is some form of improved coastal protection works. Discussions to date suggest that the MRWG and Meridian are "in the same ballpark" regarding the extent of any protection works and the cost-sharing implications and are progressing on the understanding that an agreement is likely. The next meeting with the MRWG is scheduled for 31st July 2008 and further discussions will be required to determine actual cost allocation and direct consultation with any affected land owners.

The MRWG have stated they are required to present the recommended option to the wider ratepayers association. It is therefore probable that a definitive solution to the existing and MHP related erosion problem will not be resolved by the time the hearing commences, however all parties hope to present an 'agreement in principal' such that

consent conditions can be used that offer tangible, mutually agreeable and flexible outcomes.

Meridian note that the MRWG are satisfied with the process being undertaken to date and that the Mokihinui Ratepayers Association have submitted in support of the MHP consent applications.

WCRC Request 4.11

- 4.11 Please provide copies of additional reports (if any) which have been tabled on coastal and river erosion issues to the community working group and other potentially affected parties such as Transit New Zealand, Local Iwi, white-baiters, and fish and game.

Reason for request: - In order for the consent authority to consider appropriate conditions to mitigate adverse effects of the proposal, and in order to consider the conditions proposed by Meridian

Meridian Response 4.11

Three additional reports and memorandums (other than those included as technical reports in the resource consent application) have been prepared which relate to the existing state of coastal erosion at Mokihinui, the effect of MHP on coastal erosion, and options for mitigating both natural and MHP induced coastal erosion effects. These are:

1. A draft peer review undertaken by Dr Kerry Black of ASR on the Shoreline Change report prepared by Dr Murray Hicks of NIWA. This review was commissioned by the Mokihinui Community Consultation group. A copy of the peer review is provided in Attachment B
2. Memorandum to Kerry Black (ASR) from Richard Little (Meridian) with Meridian's comments on the review undertaken by ASR on Dr Murray Hick's Shoreline Change report. A copy of this memorandum is provided in Attachment B.

Please note: Following the peer review and Meridian response, the Mokihinui Community Consultation group agreed that the Kerry Black report did not meet its objectives and have not requested that the draft peer review be finalised. The Mokihinui Community Consultation group is satisfied that the establishment of the Mokihinui Ratepayers Association working party (MRWP) and the progress made to date between the MRWP and Meridian will address their concerns.

3. A discussion document was prepared by Richard Reinen-Hamill on the mitigation required to prevent existing and MHP induced coastal erosion affecting Mokihinui. This report was a discussion document used in the earlier meetings with the Mokihinui ratepayers and has been superseded by further work. A report outlining the further work has not been prepared, although this work is likely to take the form of evidence at the hearing.

To help facilitate the Councils understanding of this additional work and outline Meridian's approach to evidence on this topic, we would like to undertake a meeting at your earliest

convenience involving the Council's planner, Council's coastal consultant, Meridian consents manager and a member of the MRWG.

5.0 New Request for Further Information - Review of Engineering Matters

WCRC Request 5.7

- 5.7 With reference to Page 3 of the Damwatch report “Potential failure Modes and consequences of failure for input to dam design.” Please advise and name the qualifications of the expert that you indicate confirmed the dam will be safe at high seismic loads? Please provide a copy of the opinion.

Reason for request: - To better understand the reasoning behind the statement, and to address perceived gaps in the current information, particularly as the required peer review report or statement has not been provided as requested in RFI 5.6 and that no independent expert assessment has been provided to support the statement and that dams and earthquake risks have been raised by a number of submitters.

Alternatively, you may wish to advise a change of wording to the report.

Meridian Response 5.7

Meridian has chosen to change the wording of the report, as suggested in the request. A copy of the revised report is included as Attachment C.

WCRC Request 5.8

- 5.8 Please confirm the Population at risk (PAR) with reference to the Building Act from a Mokihinui Hydro Proposal dam failure.

Reason for request: - Page 26 of the Damwatch “Project Engineering description report” indicates the PAR would likely exceed 11 on table 3.3 (page 25), however on the basis of the number of buildings identified as at risk in the event of dam failure in the Damwatch report “Potential failure Modes and consequences of failure for input to dam design” the Population at risk is likely to exceed 100. No population at risk has been quoted in this report.

Meridian Response 5.8

The Project Engineering Report is only discussing what the Potential Impact Classification (PIC) will be, using the new Building Act criteria (yet to be authorised by Government). That criteria uses population at risk in the determination. With damage effects major and clearly more than 11 people in the path of a dam breach then the PIC is High - i.e. the most stringent safety requirements will be necessary.

Utilising the dam break maps in the Potential Failure Modes Report, most properties in Mokihinui and Seddonville are shown as flooded by a dam break. The 2006 census states that 174 people live in the Mokihinui/Seddonville area. Based on 40 houses identified in the area and if multiplied by the average persons per household for the Mokihinui (Buller)

area of 2.3 you derive 92 people. Therefore there are clearly more than the minimum requirement of 11 to achieve a High PIC.

No more comprehensive level of assessment of population numbers has been undertaken because there is no greater PIC category.

Therefore in answer to RFI5.8 the PAR is clearly more than 11 people and Meridian acknowledges the need to consult all parties in the downstream path of a dam break flood. Inundation maps have been provided to assist this process. Because the dam PIC is High and therefore requires the most stringent standards, at this juncture there is no need to quantify the PAR beyond this.

8.0 New Request for Further Information - Review of Recreation and Tourism Matters

WCRC Request 8.1

8.1 Please provide an assessment of the rates of rise and fall in the river below the proposed dam, a brief assessment of the potential risks and if risks exist how these will be mitigated.

Reason for request: - The response provided to 8.1 does not include the rates of rise and fall in the river associated with the operation of the HEPS as requested. The Hydrology report uses minimum one hour intervals in the assessment, however the project engineering description report indicates generation will follow demand. Therefore it is currently not possible to determine if there are risks present to swimmers or other recreational users downstream of the proposed dam and associated with its operation.

Meridian Response 8.1

Meridian has carefully considered the issue of appropriate rates of rise and fall in the river below the proposed dam. For hydro schemes this is generally referred to as the “ramping rate” and is expressed as the change in flow (quantified in cumecs) over a specified time interval. Most, but not all, New Zealand hydro schemes that discharge into a river or similarly accessible flowing water body have a ramping rate consent condition. The ramping rate can be specified to address a number of potential down stream values including; ecological issues; erosion issues; and health and safety issues. Existing ramping rates on other schemes vary significantly. Typical values include 30 cumecs per hour for the Waitaki Dam discharge into the Lower Waitaki River and 70 cumecs per hour for Matahina Dam discharge into the Rangitaiki River.

In the case of the Mokihinui River the principal issue for consideration is the health and safety of the river users downstream of the dam. The river is already subject to significant flow variability and our technical experts have advised us that ecological and bank erosion issues are not significant factors on this river. Our assessment of this issue has focused on the following activities:

- Swimmers and other water related recreational activities in the river downstream of the dam which occur predominantly in the summer months;
- Whitebaiters, kayakers and other river users in the tidal zone; and
- Recreational users on the river banks and margins.

The proposed operational flow range for the power scheme and hence the range over which Meridian can control the river flow is 16 to 139 cumecs. Meridian recognise that this operational range can result in diverse conditions in the river for recreational users. Meridian also notes that the natural flow regime for the river is subject to rapid changes following rain in the upper catchment.

Increasing Flows

Based on these observations and advice from our consultants on such issues as rate of river rise and river velocity changes Meridian's proposal is that the ramping rates will be limited to:

- Summer months (15th November to 30th April) - 50% of the maximum flow in the preceding 15 minutes;
- Winter months (1 May to 31 August) - 100% of the maximum flow in the preceding 15 minutes; and
- Whitebait season (1st September to 14th November) - No ramping rates. During the whitebait season, best endeavours will be made to operate MHP so that outflows match inflows as closely as practicable.

Summer Ramping Rates (15th November to 30th April)

During the summer months when the majority of recreational activities are under taken the proposed ramping rates are lowest. Assuming a minimum flow of 16 cumecs at the start of any period, this means that the river flow will be permitted to increase as a result of control being exercised by Meridian by no more than the following flow increments at no less than 15 minute time increments, 16 cumecs, 24 cumecs, 36 cumecs, 54 cumecs 81 cumecs and 120 cumecs. This ramping rate is intended to:

- Simulate the “natural” exponential change in flow that often occurs in this and other rivers.
- Allow sufficient time for river users to notice that conditions are changing and react accordingly
- Allow relatively gradual change in river conditions to occur over the low flow range when the public are most likely to view the river as being “safe” and be swimming or paddling in the shallow water areas.
- The associated approximate incremental change in water level for each step is: 16 to 24 cumecs = 14cm, 24 to 36 cumecs = 10cm, 36 to 54 cumecs = 14cm, 54 to 81 cumecs =14cm, and 81 to 120 cumecs = 12cm.

Winter Ramping Rates (1 May to 31 August)

During the winter months little recreational activities are under taken in the lower Mokihinui River. Assuming a minimum flow of 16 cumecs at the start of any period, this means that the river flow will be permitted to increase as a result of control being exercised by Meridian by no more than the following flow increments at no less than 15 minute time increments, 16 cumecs, 32 cumecs, 64 cumecs and 120 cumecs. The associated approximate incremental change in water level for each step is: 16 to 32 cumecs = 24cm, 32 to 64 cumecs = 19cm, and 64 to 120 cumecs = 21cm.

In addition to operational controls on ramping up of flows Meridian also proposes placing appropriate signage at public access points to the river to warn users that the river may be subject to sudden changes of flow at any time. Meridian also proposes erecting staff

gauges at the main swimming holes together with appropriate signage warning swimmers that the river may become subject to rapid changes in flow and become unsafe.

At this stage we are finalising some analysis of the associated changes in river velocity and other in-river parameters associated with these proposed ramping rates. We envisage that the final proposed ramping rate conditions will be similar to the ones described here but the numbers may vary slightly depending on the outcome of these studies. This analysis will be presented in evidence.

Decreasing Flows

No control is proposed on the ramping rate for decreasing river flows. This does not represent a health and safety issue.

Flood Flows

No control on increasing or decreasing ramping rates is proposed for river flows over 120 cumecs. At flows in excess of 120 cumecs the river is effectively in “flood”. The rates of change in river flow will be very close to those that occur naturally and not materially influenced by the operation of the hydro scheme.

WCRC Request 8.4

8.4 Please clarify the extent to which similar opportunities to access backcountry (remote) settings (especially by non-motorised means) exists in both the Buller District and West Coast Regions?

Reason for request: - Submitters raised the issue of a loss of 'wilderness/backcountry remote' setting under the MHP. These claims were in relation to activities such as tramping and fishing (as well as kayaking and rafting). In order to inform our view about the 'significance' of this loss, some additional regional context is needed.

Meridian Response 8.4

A ‘Wilderness Area’ on Department of Conservation land has a definition under the Conservation Act 1987 (Sec 20). The Mokihinui is not a Wilderness Area under this or any other definition (such as the Recreation Opportunity Spectrum, which requires a wilderness area to have no huts, tracks, bridges, signs or other facilities). The term has been applied loosely by anglers using the upper catchment by virtue, we assume, of the general need to access the area by helicopter – which would not be permitted in a gazetted Wilderness Area.

The West Coast Conservancy has five gazetted Wilderness Areas:

- Tasman (87,000 ha in Kahurangi National Park);
- Paparoa (31,000 ha in the central Paparoa Range);
- Adams (47,000 ha in the central Southern Alps);
- Hooker / Landsborough (41,000 ha in southern South Westland);
- Olivine (83,000 ha in Mount Aspiring National Park).

That is a total of 290,000 ha of Wilderness Area within a total of 1.912 million ha of publically accessible Conservation land on the West Coast.

Although, by definition, these areas are not provided with recreation facilities, they feature a variety of routes with the opportunity to ‘wander at will’ as permitted on almost all of the public Conservation lands (some wilderness areas, such as the Takahē habitat in the Murchison Mountains Special Area are closed to public access).

The West Coast Te Tai O Poutini Conservation Management Strategy – draft 2007 (CMS) defines the study area as ‘backcountry-remote’: “Within the backcountry-remote zone an extensive network of backcountry facilities (such as roads, routes, tracks, huts, bridges, cableways and signs) and road-end facilities (car parks, shelters, track information) provide access to a wide range of backcountry experiences”. (CMS, Sec 3.6.2.6, p231)

This area definition appears to be the dominant ‘recreation outcome’ classification for public Conservation land on the West Coast north of Lake Matheson. For example, see Figure 10 (Appendix 17, p62) which shows this recreation outcome zone in the Karamea Place stretching from the Karamea Bluffs in the north to the Buller River in the south. All these areas are ‘wander at will’ settings, and although there are a number of better-known tracks and routes (see below) there are extensive undefined access options to ‘backcountry-remote’ settings throughout the region.

The ‘backcountry-remote’ definition in the CMS will still apply to the Mokihinui River with the scheme in place, although the area immediately around the dam site will change to a ‘frontcountry’ site, which, “are located adjacent to formed and maintained roads and include facilities such as picnic and camping areas, toilets, water supplies, signs, interpretation panels, lookout points, wharves, boat ramps, shelters, bridges, easy walking tracks and car parks.” (CMS, Sec 3.6.2.7 p234).

The ‘remote’ area defined in the CMS east of the North Branch will be unaffected by the proposal (see Figure 10, Appendix 17, p62).

As such, within the broad management scale applied by the Department of Conservation, the setting will largely retain its essential setting qualities (notwithstanding the loss of opportunity to kayaking and rafting). The key difference will be the ability to access the catchment more easily by water-craft. This has the potential to increase the number of people within the setting and the encounter rate between parties – although the setting will remain ‘backcountry-remote’. While we recognise the potential value of the lake to motorised recreation (jet and power boats), our recommendation is that a set of restrictions on the use of motors on the lake be agreed at the regional level to maintain the peaceful qualities of the setting. This will maximise the benefit to boaters, hunter and anglers, while maintaining an appropriate set of opportunities for flatwater kayakers and trampers.

As such, we contend that, first, the area is not currently wilderness and this quality cannot therefore be lost, and second, the ‘backcountry-remote’ qualities of the setting will be largely retained for walkers, trampers, anglers, hunters, plus flatwater kayakers and other boat users.

The following tramping tracks in similarly zoned settings on the West Coast are drawn from various publications, such as Tramping New Zealand, detailing 400 tramping tracks in NZ (Moore 2004, Spot X Tramping NZ Ltd), 101 Great Tramps in NZ (Pickering and Smith 2004, Reed Publishing) and the Department of Conservation website. None of these refer to the Mokihinui Track. This list represents only those which are recognised as ‘named’ tramps and does not include all the relatively little-used routes and tracks in the region which would be well-known to many hunters and experienced trampers. These include the likes of the Kiwi Track (off the Wangapeka), Matiri River, Mokihinui Gorge Track, Fyfe River, Lyell Walkway, numerous tracks and routes into the Paparoa Ranges, the Wanganui River, the Perth and Whataroa Rivers, Christmas Flat (Karangarua River), the Okuru River, Waiatoto River and so on.

The ‘Better Known’ Regional Tramping Tracks					
Track	Length (km)	Time	Location	Grade ¹	Track Classification ²
Buller District					
Heaphy Track	82	4 -6 days	Between Karamea and Takaka	Easy	Great Walk/ easy Tramping Track
Buckland Peaks Track	12	1 – 2 days	Buller Gorge Rd near Westport	Moderate	Tramping Track
Kirwins Reward Track	33	2 – 3 days	12km north of Reefton	Moderate	Tramping Track
Leslie – Karamea Track	91	6 -7 days	Flora car park at head of Graham Valley	Moderate to Demanding	Tramping Track
Wangapeka Track	52	4 days	Little Wanganui, south of Karamea	Moderate	Tramping Track
Ohikanui River Valley		½ - 2 days	Ohikanui River Bridge	Moderate	Walking Track
Inland Pack Track	27	2-3 days	Punakaiki and walk towards Fox River	Moderate	Tramping Track
Other West Coast tracks					
Croesus Track	19	2 days	Smoke-ho Creek Carpark, 6km from Blackball	Moderate	Tramping Track
Lake Christabel Circuit	43	2-3 days	West of Springs Junction	Moderate	Tramping Track

¹ **Grade:** Fitness level and skills required to walk the track. Rating defined by source of information.

² **Track Categories** (from DOC):

- Easy Access Walk – Short walk for people of all abilities, suits wheelchairs and children’s buggies
- Short Walk – Easy walking track that’s well formed
- Walking Track – Easy well formed walking track for longer walks
- Great Walk/Easy tramping Track – Formed track for a comfortable overnight tramp
- Tramping Track – Majority unformed, but have track directional markers, poles or cairns
- Route – Track unformed, only suitable for people with a high level of back country experience
-

The 'Better Known' Regional Tramping Tracks					
Track	Length (km)	Time	Location	Grade ¹	Track Classification ²
Frew Saddle Circuit	48	4-6 days	Inland from Ross	Moderate to Demanding	Tramping Track / Route
Whitcombe Pass	63	5-7 days	Whitcombe River	Moderate to Demanding	Tramping Track / Route
Arahura and Styx Valleys Tracks	36	3-4 days	East of Lake Kaniere	Moderate	Tramping Track
Cedar Flats Hot Pools	17	2 days	Toaroha River	Moderate	Tramping Track
Moeraki Valley Track	11	2 days	40 km north of Haast	Moderate to Demanding	Tramping Track
Copland Track	26	2-3 days	South of Fox Glacier	Moderate	Tramping Track
Haast to Paringa Cattle Track	32	3 days	Waiata River to Moeraki River	Moderate	Tramping Track
Barn Bay to Martins Bay	70	4-5 days	South Westland. Links to Hollyford	Moderate	Tramping Track / Route

WCRC Request 8.5

8.5 Please provide comment and/or additional information about the accessibility and status of the regionally proximate grade III - IV rivers, relative to the Mokihinui River. In other words, are there other rivers (the Buller River is one) in the region that share the status of "most popular", "15 very best", "21 recommended"?

Reason for request: - Figure 4 (p.28, Appendix 17) shows kayaking rivers in the South Island by grade. A cluster of similar grade III - IV rivers is identified to the Southwest of the Mokihinui River, as well as one to the north (the Karamea River). In Appendix 17 (s.4.7), the applicant reports that the Mokihinui is rated in a "comprehensive" river guidebook as "one of the 37 most popular river trips and one of 15 of the very best of the difficult white-water trips in the South Island". Similarly, the applicant uses a more recent (2006) guidebook to show that the Mokihinui is "one of 21 recommended grade III to IV rivers in the South Island". In order to inform our view about the 'significance' of this loss, some additional regional context is needed.

Meridian Response 8.5

Egarr (1995) – the more 'comprehensive' river guide – lists the following 'best river trips' (defined as 'some of the most popular rivers in the South Island') in the Buller – West Coast areas. Access options are added in brackets.

- Karamea River (helicopter)
- Mokihinui River (helicopter)
- Buller River system: Gowan and Buller to Owen River (car); Owen River to Mangles (car); O'Sullivan's to Ariki (car), Earthquake rapids (car); Matakitaki River (car); Maruia River to Mount Rutland (car)
- Grey River system: Gentle Annie Gorge (car); Crooked River (2hr walk / helicopter); Arnold River (car)

- Taipo River (helicopter)
- Hokitika River: Frisco/Karikari Canyon (helicopter) ; Whitcombe River (helicopter)
- Landsborough River (helicopter)
- Waiatoto River (helicopter)

Of the ‘best river’ list, 61 runs on 37 rivers (or river systems) are named, and 16 of the runs are in the Buller – West Coast area.

Egarr’s list of ‘best whitewater trips’ in the Buller – West Coast area is:

- Karamea River – Gorge (grade 4) (helicopter)
- Karamea River (grade 3 to 4) three day trip (helicopter)
- Mokihinui River (grade 3 to 4) (helicopter)
- Buller River: Granity Creek section (grade 2 to 3) (car); O’Sullivans to Ariki (grade 3) (car); Earthquake Rapids (grade 3) (car)
- Matakita River (grade 3) (car)
- Hokitika River: Frisco Canyon (grade 5) (helicopter)
- Landsborough River (grade 4 to 5) two day trip (helicopter)

Of the latter list, 20 runs on 15 rivers are named, and nine of the runs are in the Buller – West Coast area.

Charles (2006) lists 21 South Island grade 3 to 4 runs. In the Buller - West Coast areas these are (with access options in brackets):

- Buller River: Granity Creek (car)
- Buller River: O’Sullivans to Ariki (car)
- Buller River: Earthquake Run (car)
- Glenroy River (car)
- Hokitika River – Karikari Canyon (helicopter)
- Karamea River (helicopter)
- Landsborough River (helicopter)
- Makawhio River (helicopter)
- Matakita River: Earthquake (car)
- Matiri River (car)
- Mokihinui River (helicopter)
- Ngakawau River (car)
- Toaroha River – lower (helicopter)
- Toaroha River – upper (helicopter)
- Totara River (car)
- Waiatoto River (helicopter)
- Waiho River (car)

13.0 New Request for further information – Economics

WCRC Request 13.1 and 13.2

- 13.1 Please provide a cost benefit analysis from a national perspective. Where practical, please include an estimate of non-market costs and benefits and where this is not reasonable please identify the non-market costs and benefits not valued in the cost benefit assessment.
- 13.2 Please provide an economic impact analysis from a local and/or regional perspective.

Reason for requests: - The application does not demonstrate the economic efficiency of the proposal. To effect a balance with all other matters in coming to our recommendation we require tangible details on the benefits arising from the efficient use of the resources.

Meridian Response 13.1 and 13.2

A costs benefit analysis such as has been requested is not considered necessary to support the application. There is nothing that Meridian is aware of in the RMA which requires such an analysis before a determination as to whether or not a proposal promotes sustainable management can be made. In particular, Meridian has identified and described in the AEE a range of local, regional and national benefits. These are summarised at section 6.1 of the AEE. Meridian has also described the actual and potential adverse effects of the MHP and how they are to be avoided, remedied or mitigated. Meridian does not agree that all these factors need to be quantified in order for a judgement to be made as to whether the MHP promotes sustainable management.

Attachment A – Response 3.5
Photographs of the Mokihinui Gorge Track

Attachment B – Response 4.11
ASR Peer Review and Meridian Response

Attachment C – Response 5.7

Updated Damwatch Report:

“Potential failure modes and consequences of failure for input to dam design”